

Illinois Commerce Commission  
Assessment of Union Electric Company's  
Reliability Report and Reliability Performance  
for Calendar Year 2004

Pursuant to 83 Ill. Adm. Code 411.140

January 2005

## **1. Executive Summary**

Pursuant to Section 16-125 of the Illinois Public Utilities Act and the Commission's electric reliability rules as found in 83 Illinois Administrative Code, Part 411 ("Part 411"), Union Electric Company ("AmerenUE") filed its annual electric reliability report for the 2004 calendar year. This Staff report details Staff's assessment of AmerenUE's 2004 reliability report, and provides Staff's evaluation of AmerenUE's reliability performance during the 2003 calendar year.

AmerenUE reported that as of May of 2005 all its Illinois service territory had been transferred to AmerenCIPS. With this transfer, AmerenUE ceased to have any electric customers in Illinois and will not be filing future annual reliability report with the Commission. All future assessments of the reliability of AmerenUE Illinois electric customers will be part of the AmerenCIPS annual reliability report and all comments and recommendations contained in this assessment are directed to AmerenCIPS.

AmerenUE supplies electricity to approximately 62,000 customers in southwestern Illinois, including metro-east communities such as East St. Louis, Fairview Heights, and Cahokia, as well as the communities of Godfrey and Alton, further to the north.

AmerenUE's reliability report for the 2004 calendar year complied with Part 411 reporting requirements, and was organized in a logical manner to follow the order in which those requirements are listed within Part 411. In its reliability report for 2004, AmerenUE stated that its plan to improve or maintain reliable service to customers included several on-going operating practices and service reliability programs. The plan also included several specific projects, such as installing additional fusing on specific distribution circuits. Staff agreed that if AmerenUE, now AmerenCIPS executes its plan, the result should be more reliable service to customers.

Staff has been critical of AmerenUE's high CAIDI values for several years, and Ameren's CAIDI remains near its highest value. Staff urges AmerenCIPS to review the emergency response procedures in place for the AmerenUE customers for the purpose of reducing its response time when restoring service to customers.

The reliability indices AmerenUE reported for 2004 indicate that, on average, AmerenUE's customers had slightly more interruptions than customers of most other Illinois utilities, however, for those customers who experienced interruptions, the average duration was the longest in the state. AmerenUE's system average interruption frequency index (SAIFI) was seventh lowest (best), and its customer average interruption frequency index (CAIFI) was sixth lowest, when all nine electric utilities subject to Part 411 reporting requirements were considered. AmerenUE's customer average interruption duration index (CAIDI) was the highest (worst). Over the last several years AmerenUE has consistently reported one of the highest CAIDI values.

Staff inspected tree conditions at locations in East Saint Louis, Washington Park, Cahokia, and Alton. Staff found AmerenUE's tree trimming varying significantly from community to community. While the trimming in the areas inspected in East Saint Louis and Washington Park were well done there were many problems throughout Cahokia and Alton. Staff's tree trimming inspection found a noticeable decline in AmerenUE's trimming program since the last inspections in 2003.

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## **2. Introduction**

This document assesses Union Electric Company's ("AmerenUE's") 2004 reliability report, and evaluates AmerenUE's reliability performance during 2004.

Beginning with the year 1999 and at least every three years thereafter, 83 Illinois Administrative Code Part 411.140 requires the Commission to assess the annual reliability report of each jurisdictional entity and evaluate the entity's reliability performance. Code Part 411.140 requires the Commission evaluation to:

- A) Assess the reliability report of each entity.
- B) Assess the jurisdictional entity's historical performance relative to established reliability targets.
- C) Identify trends in the jurisdictional entity's reliability performance.
- D) Evaluate the jurisdictional entity's plan to maintain or improve reliability.
- E) Identify, assess, and make recommendations pertaining to any potential reliability problems and risks that the Commission has identified as a result of its evaluation.
- F) Include a review of the jurisdictional entity's implementation of its plan for the previous reporting period.

## **3. Description of Customers and Service Territory**

AmerenUE's Illinois operating area, which lies generally east and northeast of St. Louis, is generally urban and semi-rural, with the majority of its distribution facilities in urban areas. AmerenUE serves approximately 62,000 electric customers in Illinois, in 19 communities. In May of 2005 the AmerenUE service territory in Illinois was transferred to AmerenCIPS.

## **4. Description of Electric Distribution System**

AmerenUE's distribution system in Illinois consists of approximately 1370 circuit miles of distribution lines, including 197 distribution circuits and 43 distribution substations. Most of AmerenUE's distribution circuits in Illinois that are in urban areas operate at 4kV.

Subsection 411.120(b)(3)(G) requires AmerenUE to report on the age and condition of its distribution and transmission facilities. AmerenUE stated its facilities were in good condition, and provided the information shown in Table 1 regarding the age of its distribution equipment investments in Illinois:

**Table 1**  
**Average Age of Various Types of Distribution Equipment**

<b>Distribution Equipment Type</b>	<b>Depreciable Life (Years)</b>	<b>Average Age (Years)</b>	<b>Remaining Life (Years)</b>
Substation Equipment	44	27.9	15.1
Poles and Fixtures	34	18.3	15.4
Dist. Transformers	40	32.3	6.9
UG conductor and devices	45	15.2	29.9

## 5. Assessment of Reliability Report

83 Illinois Administrative Code Part 411 requires each non-exempt jurisdictional entity to file an annual reliability report for the previous year with the Chief Clerk of the Commission by June 1. AmerenUE filed its annual electric reliability report on June 1, 2005. AmerenUE filed a revised annual report on June 21, 2005 addressing missing information concerning changes in their reliability plan from prior years. AmerenUE's 2004 reliability report provides tables of reliability indices, lists components of its plan to maintain or improve reliable service to customers, and lists the causes of interruptions that occurred during the year, describes the age & condition of its system, and provides information about its worst performing circuits.

## 6. Historical Performance Relative to Established Reliability Targets

Code Part 411.140(b)(4)(A-C) establishes electric service reliability targets that jurisdictional entities (utilities) must strive to meet. These targets specify limitations on customer interruptions as well as hours of interruption that a utility must strive not to exceed on a per customer basis. Code Part 411.120(b)(3)(L) requires each utility to provide a list of every customer, identified by a unique number, who experienced interruptions in excess of the service reliability targets, the number of interruptions and the interruption duration experienced, in each of the three preceding years, and the number of consecutive years in which the customer has experienced interruptions in excess of the service reliability targets.

In April 2004, AmerenUE, along with all other regulated Illinois electric utilities, agreed to report on all interruptions (controllable and uncontrollable) in relation to the service reliability targets for the reporting periods of 2003 through 2007, and to include the specific actions, if any, that the utility plans or has taken to address the customer reliability concerns. The customer service reliability targets, as described in the April 2004 agreement with all reporting utilities, are listed in Table 2, below:

**Table 2**  
**Customer Service Reliability Targets**

Immediate primary source of service operation voltage	Maximum number of interruptions in each of the last three years	Maximum hours of total interruption duration in each of the last three years
69kV or above	3	9
Between 15kV & 69kV	4	12
15kV or below	6	18

AmerenUE indicated that in 2004, 1381 or 2.2% of its 62,521 customers experienced interruptions in excess of some combination of the quantity or duration targets for at least 3 consecutive years. In 2003, AmerenUE reported 243 or 0.4% of total number of customers experienced interruptions in excess of some combination of the quantity or duration targets for at least 3 consecutive years.

AmerenUE stated it has or plans to trim trees and install fuses to improve service for these customers. Staff agrees that tree trimming and more fuses may help reduce the quantity of interruptions for some customers. Also, since fuses can reduce the geographic area affected by an interruption and help response personnel locate the cause more quickly, fuses may help reduce the duration of some interruptions.

AmerenUE also reported that part of the circuits serving the customers that exceeded the reliability targets are on the Accelerated Fuse Tap Program. The Accelerated Fuse Tap Program reviews the entire circuit to determine greatest opportunities to reduce customer interruptions. This program is scheduled to be completed 2007. A further discussion of the Accelerated Fuse Tap Program can be found in Section 9 of this report.

## 7. Analysis of Reliability Performance

Reliability indices are useful tools when monitoring an electric utility's reliability performance. Table 3 (a-c) shows the reliability indices that utilities reported for their Illinois systems for the calendar year of 2004, sorted from best to worst reliability performance. The equation below each table explains each reliability index:

**Table 3**  
**YEAR 2003 RELIABILITY INDICES FOR REPORTING UTILITIES**

a) SAIFI		b) CAIDI		c) CAIFI	
UTILITY	SAIFI	UTILITY	CAIDI	UTILITY	CAIFI
South Beloit	0.61	MidAmerican	70	South Beloit	1.35
Interstate	0.64	Interstate	77	Interstate	1.40
ComEd	1.21	South Beloit	96	ComEd	2.00
AmerenCILCO	1.45	ComEd	128	AmerenCIPS	2.01
AmerenIP	1.49	AmerenCIPS	143	AmerenCILCO	2.03
AmerenCIPS	1.66	Mt. Carmel	177	<b>AmerenUE</b>	<b>2.05</b>
<b>AmerenUE</b>	<b>1.69</b>	AmerenCILCO	247	AmerenIP	2.26
MidAmerican	2.03	AmerenIP	268	MidAmerican	2.72
Mt. Carmel	2.69	<b>AmerenUE</b>	<b>278</b>	Mt. Carmel	2.86

**SAIFI** =  $\frac{\text{Total \# Customer Interruptions}}{\text{Total \# Customer Served}}$

**CAIDI** =  $\frac{\text{Sum of all Interruption Durations}}{\text{Total \# Customer Interruptions}}$

**CAIFI** =  $\frac{\text{Total \# Customer Interruptions}}{\text{Total \# Customers Affected}}$

These indices can be used to compare the reliability performance of various utilities, and provide an indication of whether a given utility's performance is improving or degrading over time. Since each reporting utility uses its own reporting and recording methods, direct reliability index comparisons between utilities are not exact, but can still be informative.

AmerenUE's relative position in the SAIFI, CAIDI, and CAIFI tables (Tables 3 (a-c)) indicates that, in general during 2004, AmerenUE's customers received average service in terms of the quantity of interruptions (SAIFI and CAIFI). However, once a customer experienced an interruption, the interruption was, on average, longer than the interruptions experienced by customers of any of the other reporting utilities.

When comparing the indices reported by all the utilities that filed reliability reports for 2004, Staff observed:

- AmerenUE's SAIFI of 1.69 was 12% higher (worse) than the average of the SAIFI values reported by the other eight utilities.
- AmerenUE's CAIDI of 278 minutes (over 4 ½ hours) was 68% higher (longer) than the average of the CAIDI values reported by the other eight utilities.
- AmerenUE's CAIFI of 2.05 was 1% lower than the average of the CAIFI values reported by the other eight utilities.

A discussion of AmerenUE's reliability performance can be found in Section 8 of this report.

The results of an annual independent survey indicate that AmerenUE's residential customers give AmerenUE a reliability score of 8.56 out of 10, and its non-residential customers give AmerenUE a reliability score of 8.37 out of 10. AmerenUE stated it received no formal complaints to the Commission relating to reliability during 2004.

Table 4 shows the 2,522 interruptions that occurred in 2004 by cause category. AmerenUE reported that the highest percentages of customer interruptions in 2004 were caused by weather at 37%. Intentional was listed as the cause for 18% of the interruptions, and overhead equipment was the third highest cause at 15% of the total interruptions. The number of weather-caused interruptions (940) increased by approximately 28% from the 732 attributed to that cause in 2003. Some of the interruptions attributed to weather may have also been tree related. Tree related interruptions (266 or 10.6% of the total number of interruptions) were up 21% from the 219 interruptions attributed to trees in 2003. AmerenUE only classified four interruptions as being caused by animals this is the same number classified as being caused by animals in 2003. This number appears to be very low and Staff suggests that Ameren provides additional training to their personnel on properly classify interruption causes.

**Table 4**  
**TOTAL INTERRUPTIONS BREAKDOWN BY CAUSE**

Interruption Cause Category	Number of Interruptions	Percent of Total Interruptions
Animal Related	4	0.2%
Tree Related	266	10.6
Employee/Contractor Personnel Errors	21	0.8
Underground Equipment Related	24	0.9
Transmission/Substation Equipment Related	3	0.1
Weather	940	37.3%
Intentional/Maintenance	456	18.1
Other Alternative Supplier/Utility	0	0
Customer Equipment	28	1.1%
Public	104	4.1
Overhead Equipment Related	384	15.2
Unknown	147	5.8
Other	145	5.7%
<b>TOTAL:</b>	<b>2522</b>	<b>100.00%</b>

Code Part 411.120(b)(3)(I)&(J) requires the reporting utility to list its worst performing circuits (subsection I) and then state (subsection J) what corrective actions are planned to improve those circuits' performance. Table 5 shows the AmerenUE circuits with the highest (worst) reliability indices for 2004. The bolded values represent the indices that caused the circuit to be a worst performer.



**Table 5**  
**AmerenUE's Worst Performing Circuits for 2004**

<b>Circuit#</b>	<b>SAIFI</b>	<b>CAIDI</b>	<b>CAIFI</b>
308-002	0.18	<b>2353</b>	1.00
334-003	<b>3.27</b>	70	3.27
342-003	<b>4.15</b>	410	<b>4.15</b>
346-002	3.23	810	<b>3.23</b>
374-066	1.00	<b>2379</b>	1.00

AmerenUE listed the following actions, taken or planned, to improve reliability on its worst performing circuits:

- Circuit 308-002: AmerenUE completed mid-cycle tree trimming of this circuit in February, 2004.
- Circuit 334-003 and Circuit 342-003: AmerenUE installing additional fuses as part of their 2005 Tap Fusing Program.
- Circuit 346-002: AmerenUE installed additional fuses in four locations and tree trimming is scheduled to be completed in 2005.
- Circuit 374-066: AmerenUE plans no corrective actions, stating high CAIDI from one underground outage that was repaired.

Staff agrees with AmerenUE's decision to add additional fusing to its worst performing circuits, as fuses have the effect of reducing the number of customers affected by an interruption, while at the same time aiding AmerenUE's restoration personnel by limiting the geographic area they must patrol when looking for the interruption cause, thereby likely reducing the interruption duration.

Ameren should also review its interruption response procedures for its Illinois customers, with the goal of reducing CAIDI. Customers supplied by Circuits 308-002 and 374-066, on average, experienced 39.2 and 39.7 hours of interruptions during 2004, respectively.

#### Staff's 2005 Circuit Inspections

During May of 2005, Staff conducted field inspections of three AmerenUE circuits that had SAIFI values that exceeded AmerenUE's average value. When inspecting these circuits, Staff looked for characteristics that would explain the circuits' relatively poor performance, such as tree contacts, deteriorated poles, damaged equipment, etc. A summary of Staff's 2005 inspections was sent to AmerenUE during May, 2005 (see Attachment A).

A description of each of the circuits Staff inspected follows:

**Circuit #342-003**

SAIFI=CAIFI=4.15; CAIDI=410

This 4kV circuit, a 2004 worst performing circuit due to SAIFI, serves approximately 790 customers in East Saint Louis and Washington Park. This circuit is short and compact serving only urban load.

Of the seventeen outages on this circuit in 2004, four were total circuit outages. Eight of the outages AmerenUE reported were caused by weather, six were due to overhead equipment problems, and two were due to trees. AmerenUE reported that their general circuit-wide trim of this circuit was completed in May 2003 and mid-cycle trimming was completed in February 2005. Staff inspected this circuit in May, 2005 and found only two locations where vegetation was contacting the primary, and was generally pleased with the tree clearances along this circuit and the condition of the distribution facilities. The only threat to reliable service that Staff noted was due to the apparent age of the facilities, photos number 1 and 2 show examples of the aged hardware found during the inspection. Staff did find many potential problems with older poles and hardware. See Attachment A for a listing of seven locations where pole or hardware concerns were observed.

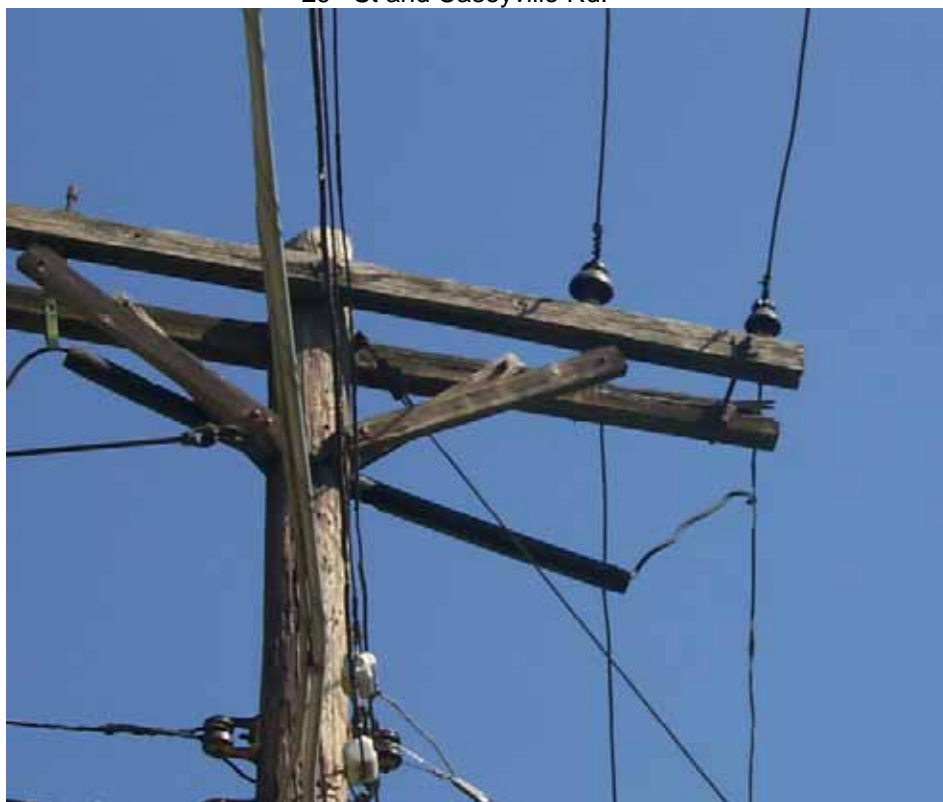
**Photo 1: Two split crossarms**

VanBuren and 44th Street



**Photo 2: crossarms weathered and brace off**

29<sup>th</sup> St and Caseyville Rd.



AmerenUE reported that no major improvement projects have been done on this circuit in the past three years. AmerenUE did report that this circuit is on their 2005 Tap Fuse Program and Pole Inspection & Treatment program.

Ameren should consider starting a program to replace the old facilities and bad poles on this circuit in an attempt to improve its overall reliability.

**Circuit #346-004**

SAIFI=CAIFI=2.47; CAIDI=528

Like Circuit 342-003, Circuit 346-004 is a relatively small 4kV circuit that that serves urban load in East Saint Louis. This circuit is a next to worst performing circuit due to SAIFI, which serves approximately 450 customers.

Of the twelve sustained interruptions on this circuit during 2004, two of which were total circuit outages. AmerenUE categorized three outages as weather related, three to overhead equipment, and two each to trees, and vehicles. AmerenUE reported completing its mid-cycle trimming of this circuit in July 2004 and plans to start the circuit-wide trimming in March 2005. Staff found three locations where vegetation was close or in the primary. No other problems were found on this circuit. See Attachment A for the locations of the vegetation problems.

AmerenUE reported that fused switches and fuses have been installed on this circuit in the past two years. The circuit was also included in the 2004 pole inspection and

treatment program which resulted in numerous poles either been replaced or will be replaced by August 2005. AmerenUE reported that no additional projects are planned for this circuit.

As with Circuit 342-003, based on AmerenUE's recent tree trimming and the reasonably good condition of the circuit's distribution facilities, Staff expects that Circuit 346-004 will now provide better service.

### **Circuit 343-001**

SAIFI=CAIFI=2.39; CAIDI=732

This 4kV circuit, a 2004 next to worst performing circuit due to SAIFI, serves approximately 180 customers in Fairview Heights. This circuit is very short and compact.

In 2004 AmerenUE reported six sustained interruptions on this circuit, of which two were total circuit outages. AmerenUE categorized three outages as weather related, two were tree related, and one was overhead equipment related. Staff's inspection of this circuit found one potential reliability concern, a split pole top, which is described in Attachment A. AmerenUE reported that a complete circuit tree trimming was finished in December 2004. AmerenUE also reported that no major improvements have been made to this circuit in the past three years and that this circuit was on the 2005 Tap Fuse Program.

Based on AmerenUE's recent tree trimming and the good condition of the circuit's distribution facilities, Staff expects that Circuit 343-001 will now provide better service.

### **Tree Trimming:**

On June 6, 2005, Staff inspected tree conditions at locations in East Saint Louis, Washington Park, Cahokia, and Alton. Staff found AmerenUE's tree trimming varying significantly from community to community. While the trimming in the areas inspected in East Saint Louis and Washington Park were well done there were many problems throughout Cahokia and Alton. Staff's tree trimming inspection found a noticeable decline in AmerenUE's trimming program since the last inspections in 2003.

Attachment B is Staff's report on its 2005 findings of AmerenUE's tree trimming effort. Staff is recommending, in its report, that Ameren should investigate the problem areas noted in the report and that they should resolve all existing tree clearance problems as soon as possible.

AmerenUE reported that AmerenCIPS, who is operates and maintains AmerenUE's Illinois service territory as of May 2005, will continue to maintain AmerenUE's current vegetation management program.

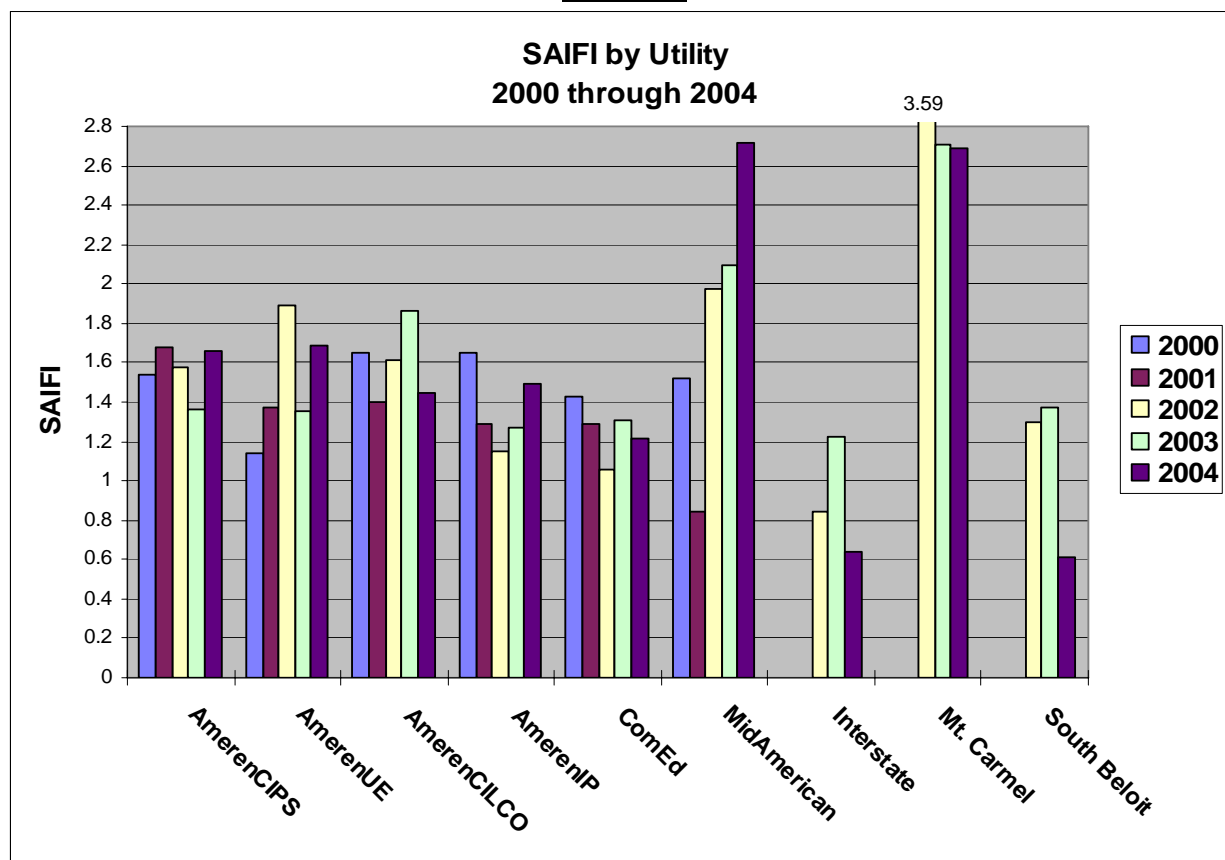
## **8. Trends in Reliability Performance**

Figure 1 shows a comparison of company-wide SAIFI values reported by the Illinois utilities for years 2000 through 2004. AmerenUE's reported 2004 company-wide SAIFI performance decreased approximately 25% from its 2003 value, and was approximately

## 2004 Reliability Assessment: AmerenUE

12% higher than the average of the SAIFI values reported by the nine utilities (AmerenUE's 2004 SAIFI was 1.69 and in 2003 it was 1.35).

**Figure 1**



AmerenUE does not appear to be establishing a trend in its reported overall SAIFI reliability performance. The fluctuation in the SAIFI value can be partially due to the small service area AmerenUE had (AmerenUE's service area was transferred to AmerenCIPS in May 2005) and the number of storms that occurred during the year. The trend does show AmerenUE customers consistently experience slightly more interruptions than other Illinois utility customers. AmerenUE did report that they experienced four severe storms in 2004 that affected their SAIFI performance.

Figure 2 shows a comparison of SAIFI values for each company's single worst performing circuit as reported by the Illinois utilities for years 2000 through 2004. AmerenUE's reported 2004 worst-circuit SAIFI performance of 4.15 was near the middle of all the nine reporting Illinois utilities for 2005. AmerenUE has not yet reported enough worst-circuit SAIFI data to establish a significant trend.

**Figure 2**

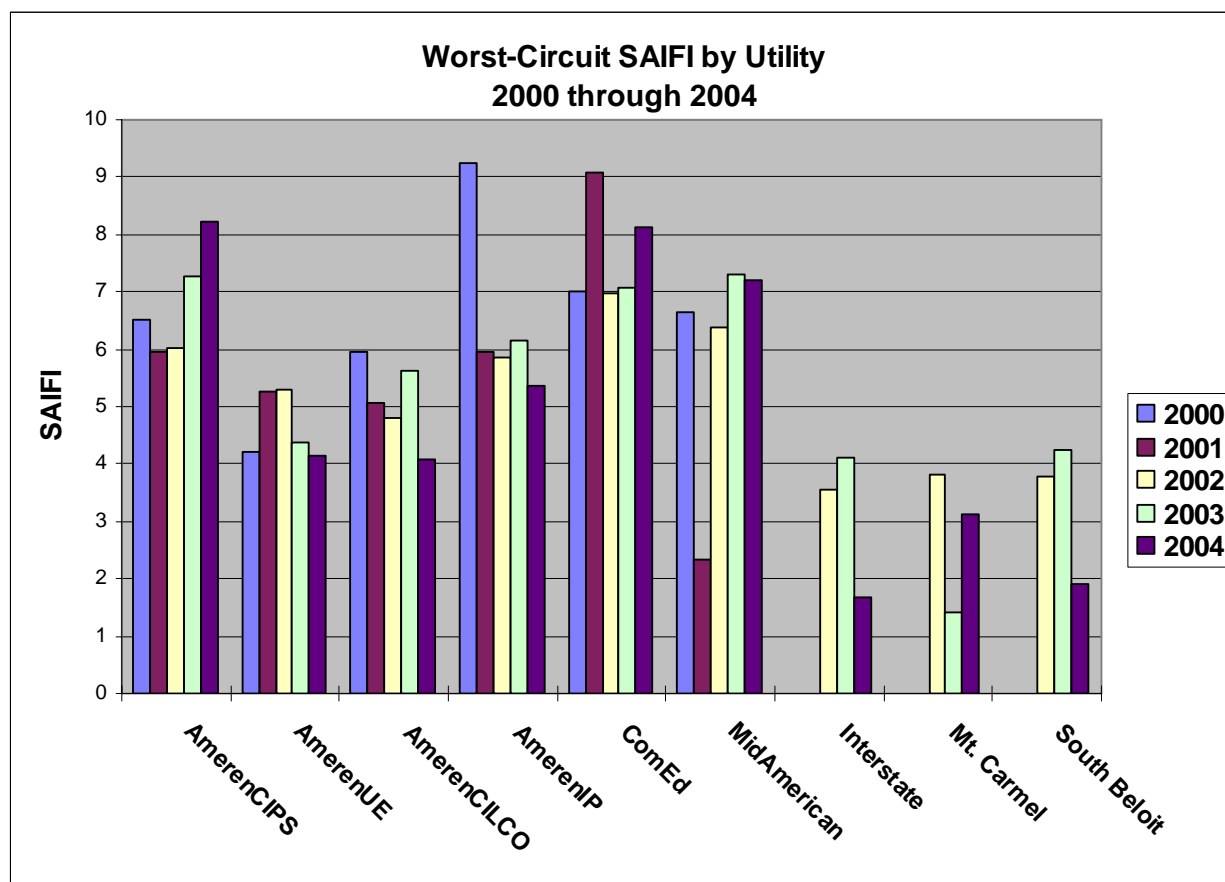
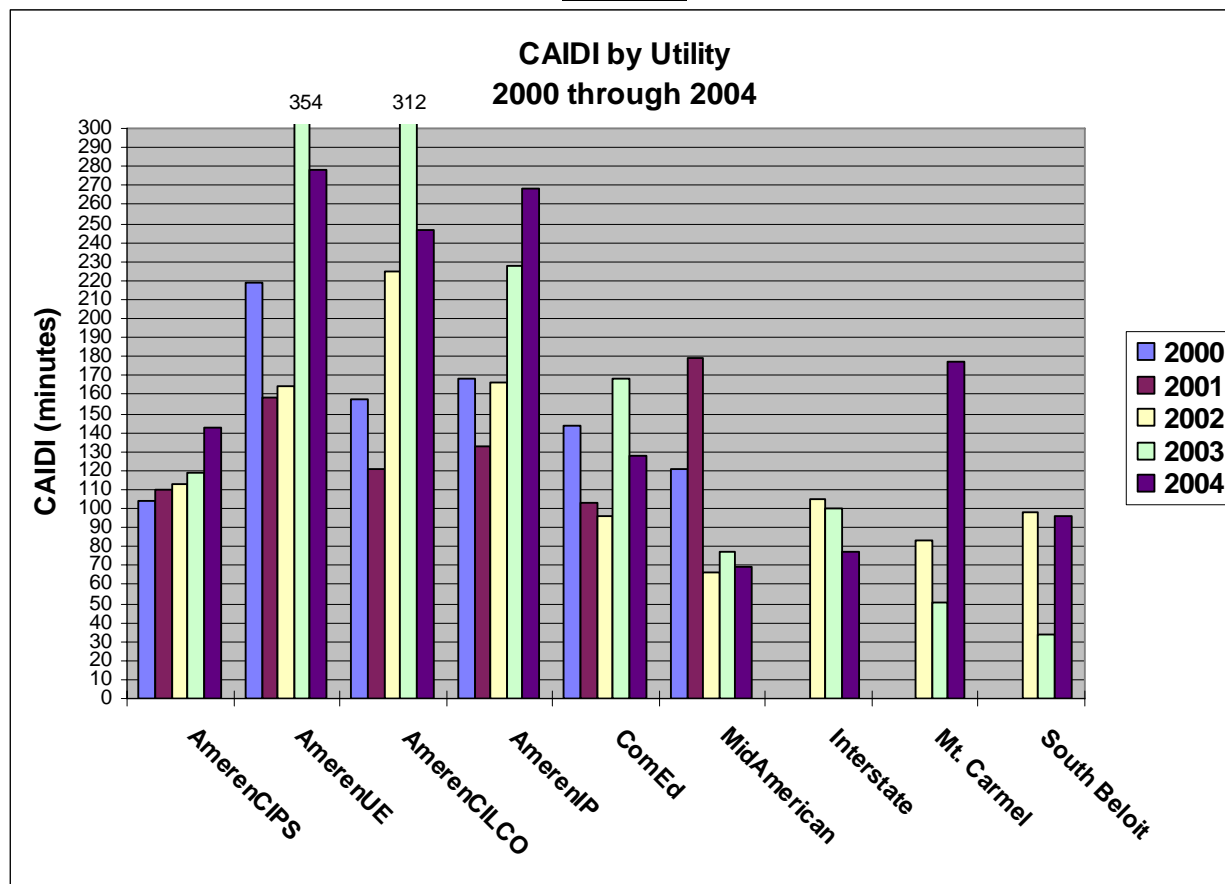


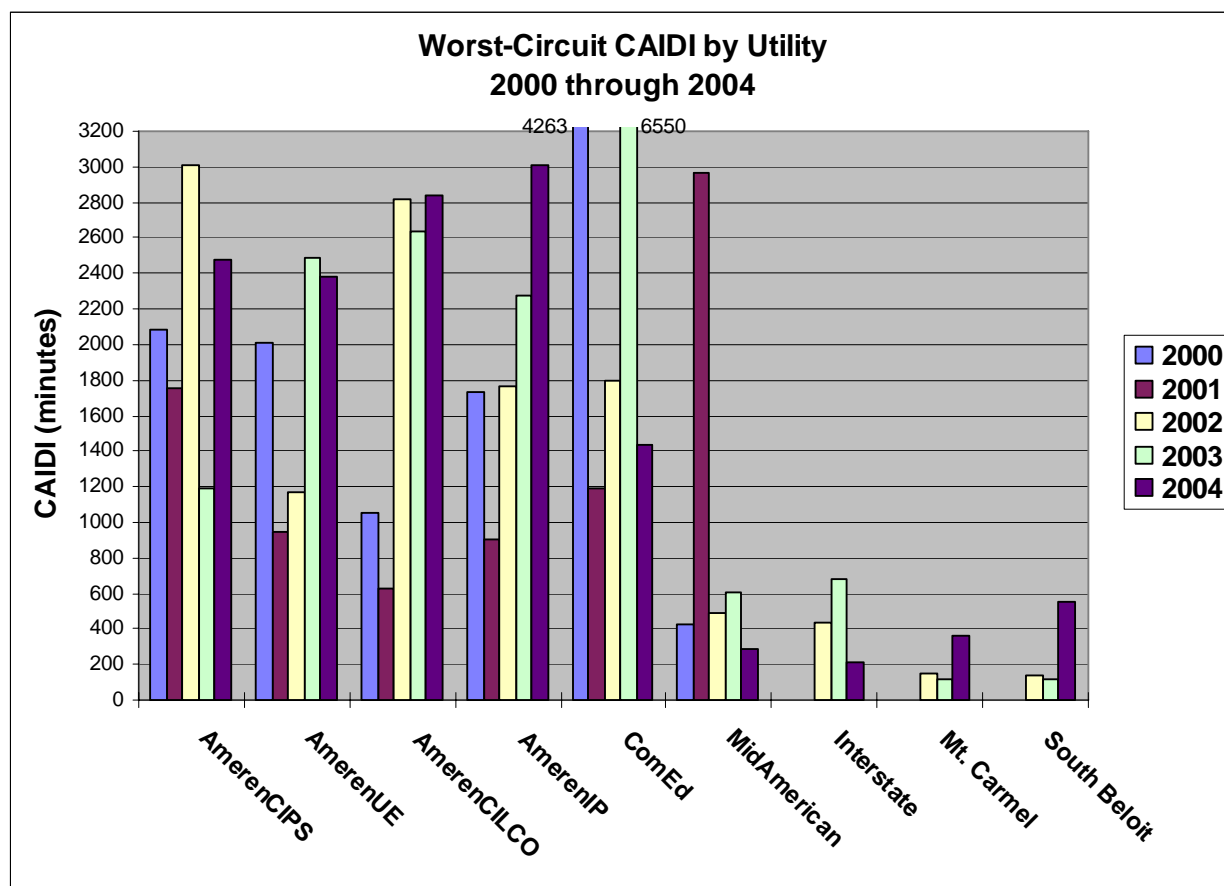
Figure 3 shows a comparison of company-wide CAIDI values reported by the Illinois utilities for years 2000 through 2004. At 278 minutes, AmerenUE's reported 2004 company-wide CAIDI performance was the worst reported by the nine-utility group, with the average being 165 minutes. AmerenIP (at 268 minutes) and AmerenCILCO (at 247 minutes) were the next worse company-wide CAIDI performers. AmerenUE's 2004 company-wide CAIDI was significantly less (better performance) than its reported overall CAIDI for 2003 of 354 minutes, but still poor.

**Figure 3**



In four of the past five years listed on Figure 3, AmerenUE had the highest (worst performance) company-wide CAIDI of the reporting Illinois utilities. AmerenUE has listed projects that, if completed, should improve the duration of interruptions that the AmerenUE customers are experiencing. See Section 9 for a discussion of the projects AmerenUE is proposing to improve its reliability.

Figure 4 shows a comparison of CAIDI values for each company's single worst performing circuit as reported by the Illinois utilities for years 2000 through 2004. AmerenUE's reported 2004 worst-circuit CAIDI performance of 2379 minutes was near the middle of all the nine reporting Illinois utilities for 2004.

**Figure 4**

AmerenUE along with AmerenIP and AmerenCILCO appear to be establishing a worst-circuit CAIDI trend. For AmerenUE, since 2001 and with only a slight improvement in 2004, the worst-circuit CAIDI has gone from 946 minutes in 2001 to 1170 in 2002, to 2490 in 2003, and 2379 minutes in 2004.

Table 6 shows the number and percentage of AmerenUE customers who experienced no service interruptions or less than four service interruptions for each of years 2002, 2003 and 2004.

**Table 6**  
**AmerenUE Customers with No Interruptions or Less Than Four Interruptions**

Year	Total Customers	Customers with No interruptions		Customers with < 4 interruptions	
2002	62,222	12,116	19.5%	54,657	87.8%
2003	61,932	22,264	35.9%	58,609	94.6%
2004	62,521	15,268	24.4%	58,816	94.1%



Table 7 shows the number and percentage of AmerenUE customers who experienced more than six and more than ten service interruptions for each of years 2002, 2003 and 2004.

**Table 7**  
**AmerenUE Customers with More Than Six and More Than Ten Interruptions**

Year	Total Customers	Customers with > 6 interruptions		Customers with > 10 interruptions	
2002	62,222	2,921	4.7%	32	0.0%
2003	61,932	1,476	2.4%	13	0.0%
2004	62,521	2,669	4.3%	63	0.1%

As illustrated by Tables 6 & 7, less AmerenUE customers experienced no interruptions and more customers had more than six interruptions when compared to 2003. When the number of interruptions is added to the average long duration the customers are without power when they are interrupted, AmerenUE customers are not seeing any improvement in their electric service reliability.

Staff has been critical of AmerenUE's high CAIDI values for several years, and Ameren's CAIDI remains near its highest value. Staff continues to urge AmerenCIPS to review AmerenUE's past emergency response procedures for the purpose of reducing its response time when restoring service to customers.

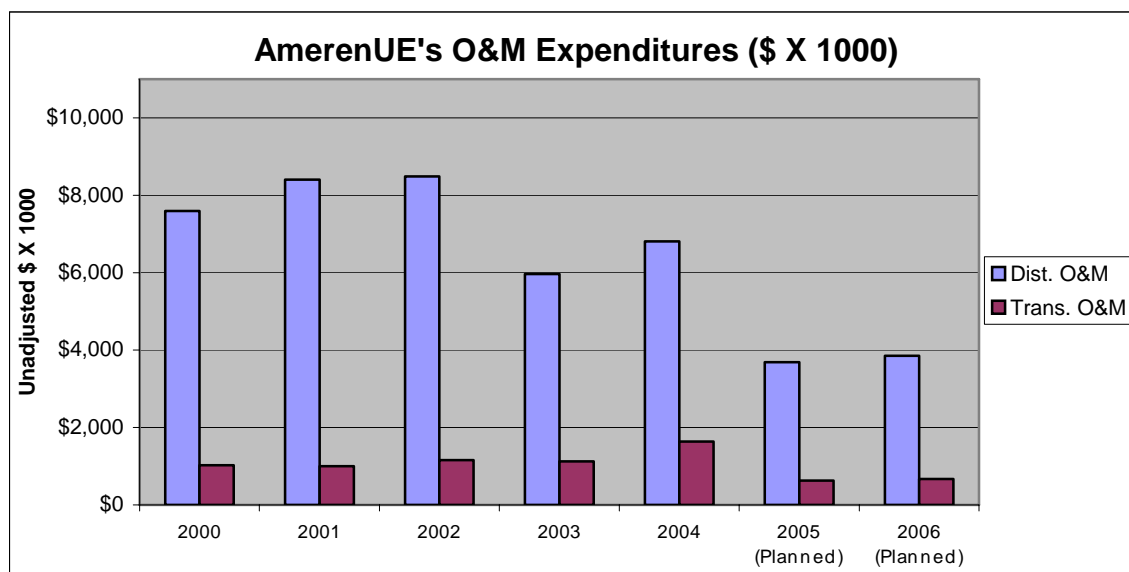
## **9. Plan to Maintain or Improve Reliability**

In its Reliability Report for 2004, AmerenUE stated that nearly all distribution and transmission expenditures have an impact on maintaining or improving reliability. Figure 5 illustrates AmerenUE's actual and planned transmission and distribution ("T&D") operations and maintenance ("O&M") expenditures for each of the years 2000 through 2006 in unadjusted dollars, and Figure 6 illustrates AmerenUE's actual and planned T&D capital expenditures.

While AmerenUE did provide future O&M and capital expenditure estimates for 2005 and 2006 the value of those numbers is very questionable when compared to prior years. Also since AmerenUE's service territory in Illinois was transferred to AmerenCIPS in May of 2005 any comparison of actual versus future expenditures is difficult. Ameren also has stated that the budget is being recalculated between their companies (CILCO, CIPS, IP, and UE) starting in 2005 which makes any comparison between prior years and the planned expenditures difficult.

If the 2005 and 2006 spending in AmerenUE Illinois service territory by AmerenCIPS remains near the amounts listed on Figures 5 & 6, Staff is concerned. Since AmerenUE customers have consistently had very long average interruption durations (CAIDI) any reduction in spending cannot help this problem. Staff will attempt to track the AmerenCIPS' spending in the AmerenUE Illinois service territory in future years.

**Figure 5**  
**AmerenUE's T&D O&M Expenditures (2000-2006)**



**Figure 6**  
**AmerenUE's T&D Capital Expenditures (2000-2006)**

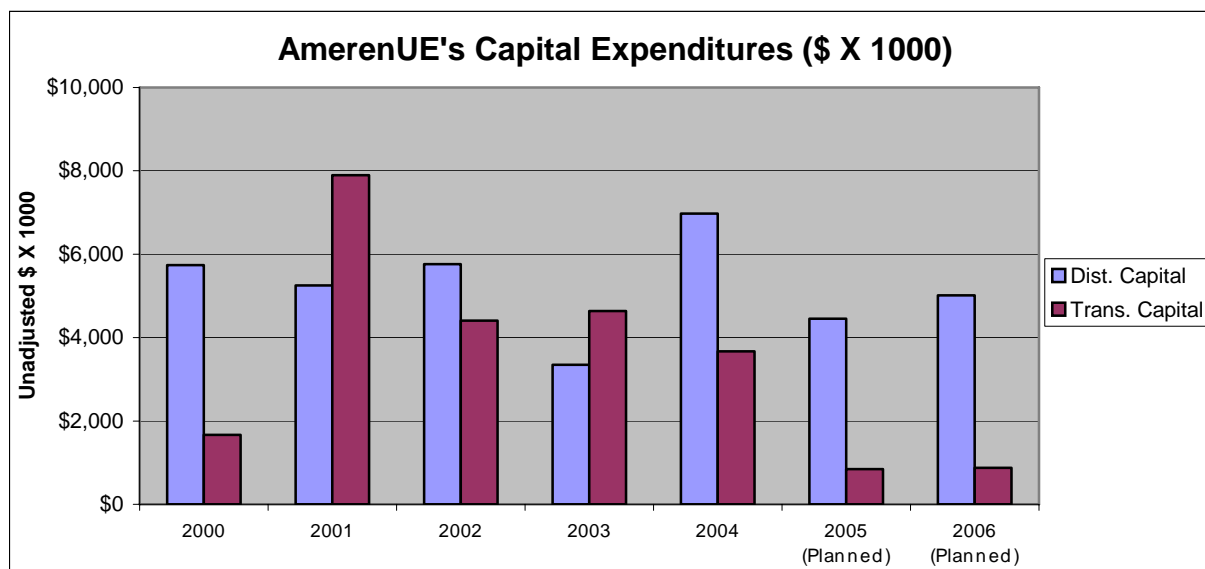
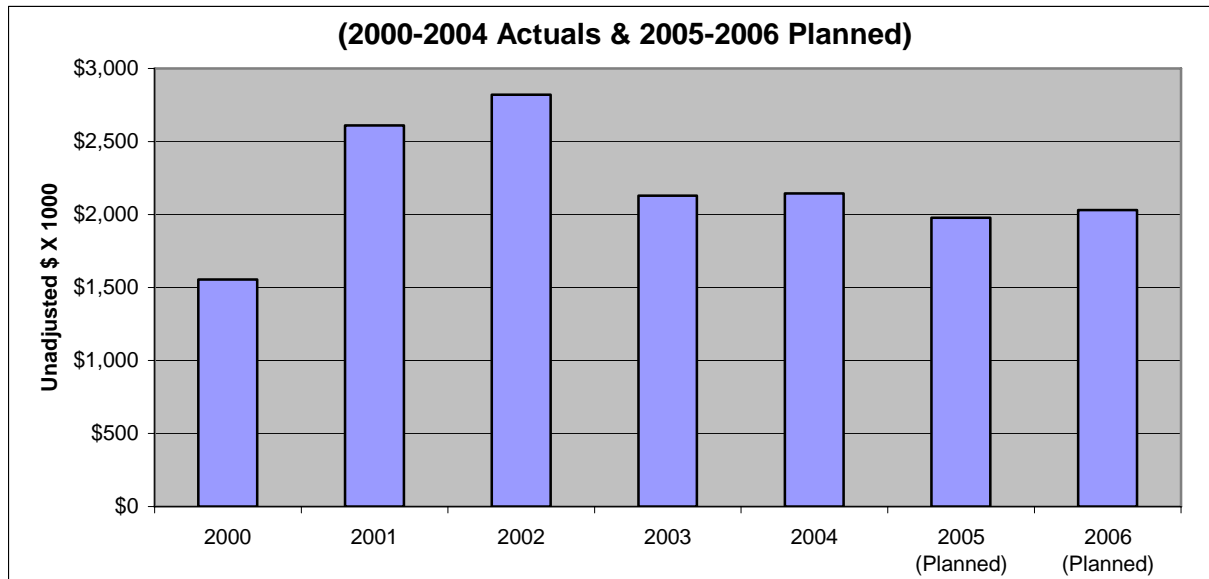


Figure 7 illustrates AmerenUE's actual and planned expenditures for tree trimming for the years 2000-2006 in unadjusted dollars. AmerenUE completed a "catch-up" tree-trimming program in 2002. AmerenUE's planned spending for 2005-2006 indicates its funding plan to sustain its improved tree trimming clearances in future years, but as mentioned previously since the AmerenUE service territory in Illinois was transferred to

AmerenCIPS in May of 2005 any comparison of actual versus future expenditures has a very limited worth.

**Figure 7**  
**AmerenUE Tree Trimming Expenditures**



In its report, AmerenUE stated that it performs numerous operating practices on a periodic, system-wide basis, which have a direct bearing upon reliability. AmerenUE considers the following seven operating practices to be among the most important:

1. Substation Inspections
2. Infra-red Scanning of Substations
3. Substation and Relay Equipment Maintenance and Testing
4. Line Inspection
5. Selective Animal Guard Installation
6. Review of System Reliability and System Loading
7. Selective Anti-galloping Conductor Installation

These are the same operating practices listed in AmerenUE's previous reliability reports, indicating no changes in this aspect of AmerenUE's plan.

AmerenUE stated its plan also includes seven on-going specific reliability programs.

1. Lightning Protection:  
AmerenUE stated it determines where lightning protection enhancement is required based on a four-year historical performance study, as well as recommendations by the local district.
2. Pole Inspection and Treatment:  
AmerenUE stated it inspects poles on its sub-transmission and distribution main-feeders to identify and repair/replace those that might otherwise fail and cause an

interruption. AmerenUE stated that poles identified during the 2004 inspections were either replaced in 2004 or scheduled for replacement in 2005.

3. Animal Protection:

AmerenUE stated it continues to add animal protection to the portions of its system that is affected or susceptible to animal caused interruptions. AmerenUE also stated that it continues to install animal protection on all new transformer installations.

4. Annual Tree Trimming:

AmerenUE states that trees growing adjacent to its circuits are trimmed according to a periodic cycle using methods that are intended to direct future growth away from the lines. AmerenUE stated it is currently trimming trees on a 3.5 year-cycle, has also initiated a mid-cycle patrol to identify troublesome fast-growing trees, and will maintain a four-year trim cycle in 2005. See Attachment B for Staff's assessment of AmerenUE's tree trimming effort.

5. Tap Fusing:

AmerenUE states it is fusing a large number of unprotected taps of the distribution backbone to reduce the number of complete feeder outages and more quickly identify the problem location. The Accelerated Tap Fuse Program is scheduled to be completed by the end of 2005.

6. Aerial Sub-transmission Infrared Inspection:

AmerenUE stated that inspections of its sub-transmission system (34 & 69 kV) are performed on a 3-year cycle. Infrared inspections are intended to identify problems such as loose connections prior to the problem resulting in an interruption.

7. Circuit Patrols:

AmerenUE states that Ameren has developed Circuit Patrol Teams to implement a standard schedule of patrolling distribution circuits. Ameren plans to complete the necessary training and roll out its new circuit inspection program in 2007.

AmerenUE did not identify or specific projects to improve reliability outside of the program listed above.

Staff agrees that AmerenUE's activities associated with its operating practices, and specific programs should contribute to maintaining or improving the reliability of service to its customers.

## **10. Potential Reliability Problems and Risks**

Staff's impression after inspecting AmerenUE's distribution circuits was that AmerenUE has taken several steps to maintain or improve reliability, including replacing poles, adding fuses, and installing more animal guards on distribution transformers. Following Staff's review of AmerenUE's 2004 reliability report and inspection of AmerenUE's distribution circuits; Staff is still concerned about the following:

- Though its geographical area in Illinois is relatively small, every year AmerenUE's CAIDI is consistently one of the highest (worst) when the indices of all reporting utilities are considered. AmerenUE has provided no indication that it is addressing its long interruption durations through any procedural or process changes. With the

transfer of AmerenUE's Illinois customers to AmerenCIPS Staff is look forward to some procedural and process changes that will improve CAIDI.

- Staff agrees with AmerenUE's decision to add additional fusing to its worst performing circuits, as fuses have the effect of reducing the number of customers affected by an interruption, while at the same time aiding AmerenUE's restoration personnel by limiting the geographic area they must patrol when looking for the interruption cause, thereby likely reducing the interruption duration.
- With Ameren's transfer of AmerenUE's Illinois service territory to AmerenCIPS, completed in May 2005, those Illinois customers previously served by AmerenUE may see a change in how reliable their service is. If the 2005 and 2006 spending in AmerenUE Illinois service territory by AmerenCIPS remains near the amounts listed on Figures 5 & 6, Staff is concerned. Only after a few years will those customers being transferred to AmerenCIPS and the Commission know if AmerenCIPS is dedicating sufficient resources to maintain or improve the level of service to those customers previously served by AmerenUE in Illinois.

#### **11. Implementation of the Plan listed in its 2004 Reliability Report**

AmerenUE reported that the remedial actions to be done in 2004 for each of its year 2003 worst performing circuits, described in its 2003 reliability report, were either completed, or accomplished by other actions. Upon reviewing the status of these planned actions for each circuit, Staff finds the corrective actions taken or revised to be reasonable.

#### **12. Summary of Recommendations**

Staff makes the following three recommendations:

- AmerenCIPS should examine the outage response procedures used by AmerenUE and attempt to reduce the average duration of interruptions to its customers. AmerenUE again listed an extremely high value for CAIDI during the 2004 calendar year: 278 minutes, or over 4.5 hours. This value is 2 hours greater than the average of the CAIDI values reported by the other eight utilities.
- AmerenUE only classified four interruptions as being caused by animals this is the same number classified as being caused by animals in 2003. This number appears to be very low and Staff suggests that Ameren provides additional training to their personnel on properly classify interruption causes.
- Staff inspection of trees in East Saint Louis, Washington Park, Cahokia, and Alton found AmerenUE's tree trimming varying significantly from community to community. Staff's tree trimming inspection found a noticeable decline in AmerenUE's trimming program since the last inspections in 2003. Staff is recommending that Ameren should investigate the problem areas noted in the report and that they should resolve all existing tree clearance problems as soon as possible.
- If the 2005 and 2006 spending in AmerenUE Illinois service territory by AmerenCIPS remains near the amounts listed on Figures 5 & 6, Staff is concerned. Since AmerenUE customers have consistently had very long average interruption durations (CAIDI) any reduction in capital and O&M spending cannot help this

## 2004 Reliability Assessment: AmerenUE

problem. AmerenCIPS should provide adequate capital and O&M funding the AmerenUE Illinois service territory to improve the infrastructure of the distribution system.

## Summary of Distribution Circuit Field Inspection by ICC Staff

Utility:	AmerenUE	Date:	5/3/05
Circuit:	East St. Louis Circuit#342-03	Inspector:	Ron Linkenback & Mike Tautphaeus of Ameren
<b>Gen. Notes:</b> This is a small 4kV circuit located in an urban area. This circuit was a worst performer in 2004. This circuit was last inspected by the ICC staff in 1999. Very few tree, weather or animal reliability concerns found. Quite old facilities observed, some beyond their useful life.			
Map No.	Item Description	Photo(s)	Location
1	Split pole top		Baleyrier Rd. between 37th & 38th St. at station 6618
	bad crossarm brace		Bushmore between 40th & 41st St
	Tree growing close to conductor		South of Bushmore between 40th & 41st St. at Station 797
	Pole top is weathered		West of 29th Street between Douglas & Natelie at Station 5062
	Crossarm end weathered	9	On 29th St. north of Caseyville Rd. at Station 5599
	Primary lead laying on secondary		North of Broadview between 35th & 37th St. at Station 1438
	Two crossarms weathered		North of Broadview between 35th & 37th St. at Station 1611
	Pole top pin loose and top of pole weathered	5	On Van Buren between 37th & 38th Street
3	Trees into primary	1 & 2	Alley south of Van Buren between 43rd & 44th Street, at Station 2608
	Vines growing into transformer		South of Baleyrier between 43rd & 44th St. Station 1583
	Two crossarms bad - split	6 & 7	VanBuren between 42nd & 43rd St. at Stat. 3588
4	Crossarm brace off		Forest Blvd. Between 44th & 45th Street

## Summary of Distribution Circuit Field Inspection by ICC Staff

Utility:	AmerenUE	Date:	5/3/05
Circuit:	East St. Louis Circuit #346-04	Inspector:	Ron Linkenback & Mike Tautphaeus of Ameren
<b>Gen. Notes:</b> This is a small 4kV circuit located in an urban area. The circuit was a next to worst performer in 2004. No record of this circuit being inspected by ICC staff in previous years. Very few problems were observed.			
Map No.	Item Description	Photo(s)	Location
1	Vines on transformer		South of Eureka St. between 79th & 80th St. at Station 6785
	Vines into conductor		South of State St. east of 82nd Street. Station 2052
	Vines growing up to the pole top		South of Grmont between 83rd & 84th St. Station 3658

## Summary of Distribution Circuit Field Inspection by ICC Staff

Utility:	AmerenUE	Date:	5/3/05
Circuit:	Fairview Heights Circuit#343-01	Inspector:	Ron Linkenback & Mike Tautphaeus of Ameren
<b>Gen. Notes:</b> A compact small 4kV circuit located in an urban area. No problems found. This circuit was a next to worst performer in 2004. This circuit has not been inspected by ICC staff in previous years.			
Map No.	Item Description	Photo(s)	Location
1	Pole top split	11	North Ruby Road north of Spivey Road near station 3039.

## **MEMORANDUM**

TO: Roy Buxton, Engineering Department Manager

FROM: Jim Spencer, Senior Electrical Engineer

DATE: August 11, 2005

RE: Tree Conditions in AmerenUE's Illinois Service Territory

### **1. Introduction**

On June 6, 2005, I performed random inspections of tree conditions near AmerenUE electric lines in AmerenUE's Illinois service territory. I was accompanied by Tom Beerman, Ameren's Superintendent of Forestry. We performed the inspections by driving around the areas chosen and looking at trees near AmerenUE overhead electric lines without regard to circuit identification and without the use of circuit maps. This memorandum documents the results of the field inspections and my assessment of the state of tree trimming on that date in Cahokia, East St. Louis, Washington Park, and Alton (all served electrically by AmerenUE).

Staff's most recent general inspections of tree conditions in AmerenUE's Illinois service territory prior to the 2005 inspections were performed on May 7, 2003. I documented those inspections in an email message to you on May 12, 2003. In that message, I noted considerable improvement in AmerenUE's tree trimming from the prior year and that the remaining tree conflicts in AmerenUE's Illinois service territory were relatively few and scattered. I also made the following statement at that time: *"Overall, I believe AmerenUE has, with considerable prodding from Staff, finally achieved a reasonable level of tree trimming in its Illinois service territory."*

Unfortunately, the 2005 inspections indicate that the quality of AmerenUE's tree trimming has declined since 2003.

### **2. Findings**

Overall, I found tree trimming to vary significantly from community to community in the relatively small Illinois service territory of AmerenUE. Trimming in the areas I inspected in East St. Louis and Washington Park was well done, with only a few isolated exceptions. There were many problems, however, scattered throughout Cahokia and Alton. Overall, I believe AmerenUE's tree trimming program has declined significantly since the 2003 inspections. The problem areas contain many tree conflicts with AmerenUE's primary conductors, including some instances of AmerenUE's primary conductors burning the trees. I have summarized my field notes of these inspections in



the spreadsheet labeled “Summary of Tree Conditions Field Inspection by ICC Staff” at the end of this memorandum.

My overall assessment of tree trimming conditions in each of the communities inspected, including example photographs of some of the tree conflicts noted, is contained in the remainder of this memorandum.

I observed many tree conflicts with AmerenUE’s lines in Cahokia, including at least three locations where the trees had been burned by AmerenUE’s primary conductors. The problems were not isolated to certain sections, but were scattered throughout the town along the route I drove during the inspection. Figures 1 through 4 show examples of some of the tree conflicts observed in Cahokia.

**Figure 1 (Photo 0501)**  
**Siberian elm tree into 4 kV primary (with burning)**  
**Judith Lane west of Falling Springs Road, Cahokia**



**Figure 2 (Photo 0507)**  
**Chinese elm tree into primary**  
**Nelson Ave. NE of Leon St., Cahokia**



**Figure 3 (Photo 0508)**  
**Primary through soft maple tree**  
**Jerome Ln. SE of Genevieve Pl., Cahokia**



**Figure 4 (Photo 0504)**  
**Box elder tree into 3-phase primary**  
**Elizabeth St. just SW of Jerome Ln., Cahokia**





Tree trimming all along the route inspected in East St. Louis looked very well done, except for one location where a pin oak tree had grown into an AmerenUE 34 kV line. This location is shown in Figure 5. I did see fresh cuts on some of the trees in East St. Louis.

**Figure 5 (Photo 05O13)**  
**Pin oak tree growing into a 34 kV line**  
**Ohio Ave. between 29<sup>th</sup> & 31<sup>st</sup> Sts., East St. Louis**





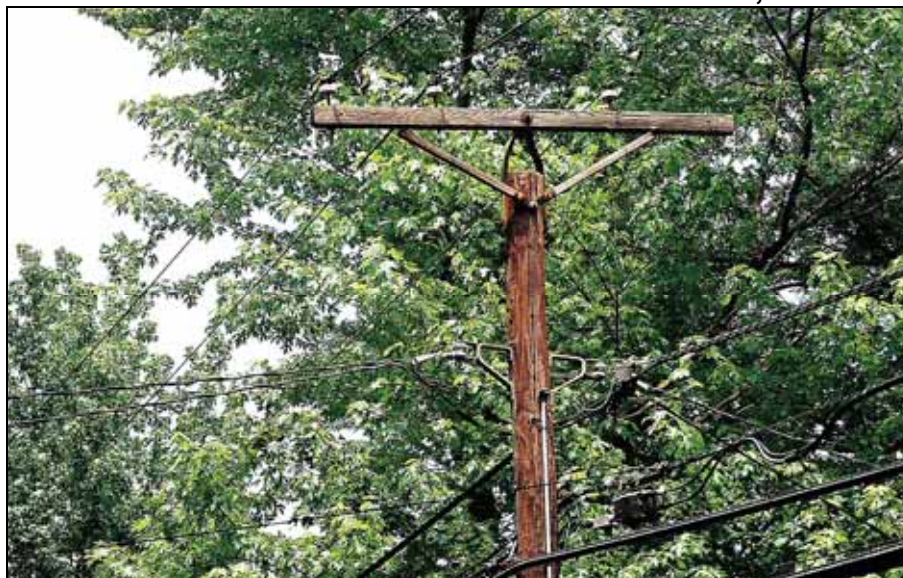
Tree trimming along the route inspected in Washington Park was also very well done, with only two problem locations noted. One of those locations is shown in Figure 6.

**Figure 6 (Photo 05O14)**  
**Chinese elm tree into 3-phase primary**  
**Hill Ave. between 60<sup>th</sup> & 61<sup>st</sup> Sts., Washington Park**



I found many tree trimming problems in Alton, scattered throughout the route I chose to inspect. Most of these conflicts involved fast growing tree species. AmerenUE clearly has not trimmed trees in Alton to adequately allow for the amount of tree growth that has occurred before it trims the trees again. Some of the conflicts noted are shown in Figures 7 through 9.

**Figure 7 (Photo 05O20)**  
**Primary through edge of soft maple tree**  
**Main St. between Grandview & Sanford Aves., Alton**



**Figure 8 (Photo 05O21)**  
**Chinese elm tree into primary**  
**Main St. south of Benbow, Alton**



**Figure 9 (Photo 05O19)**  
**Primary through several locust trees**  
**Ida St. west of Main St., Alton**



In summary, I found a significant number of problems with AmerenUE's tree trimming in its Illinois service territory this year, and a very noticeable decline in its program since my last inspections in 2003. While trimming in East St. Louis and Washington Park generally looked good, there were many obvious tree conflicts throughout Cahokia and Alton. AmerenUE has not met the tree trimming requirements specified in NESC Rule 218 in those areas.

### **3. Recommendations**

- AmerenUE should investigate the problem areas discussed in this memorandum to determine the cause of inconsistency of tree trimming in these areas with the rest of its tree trimming program in Illinois.
- AmerenUE should resolve all existing tree clearance problems in its Illinois service territory as soon as possible.
- AmerenUE should assure that it meets the requirements of NESC Rule 218 by assuring that all trees in its Illinois service territory are trimmed such that there are no tree contacts with its energized primary conductors before it returns to trim them again.

Summary of Tree Conditions Field Inspection by ICC Staff			
Utility:	AmerenUE	Date:	6/6/05
Circuits:	Random	Inspector:	J. D. Spencer, Tom Beerman (Ameren)
Gen. Notes: Tree trimming throughout East St. Louis and Washington Park looked very good, with only a few exceptions. There were many conflicts, however, in Cahokia and in Alton.			
Town	Item Description	Photo(s)	Location
<b><u>Cahokia</u></b>			
	Primary burning sweet gum tree (covering on phase conductor also burnt)	O12	Plum St. between 2nd & 3rd Sts.
	Hard maple tree very close to primary		2nd St. between Main & Elm Sts.
	Pear & maple trees very close to primary		Plum St. just south of 5th St.
	Soft maple tree into primary		Plum St. just north of 7th St.
	Gum & box elder trees into primary		Plum St. at Adele Ave.
	Siberian elm tree into 4 kV primary (tree burned)	O1, O2	Judith Lane west of Falling Springs Rd.
	Chinese elm tree close to primary		Judith Lane west of Falling Springs Rd.
	Alianthus (tree of heaven) tree into primary	O3	Judith Lane west of Falling Springs Rd.
	Elm tree close to primary		Jerome Lane just north of Upper Cahokia Rd.
	Siberian elm tree very close to primary		Range Lane east of St. Michael Dr.
	Chinese elm tree into primary, with burning	O7	Nelson Ave. between Leon St. & Jerome Lane
	Box elder tree in the 3-phase primary	O4	Elizabeth St. just southwest of Jerome Lane
	Single-phase primary through the edge of a Chinese elm tree	O5, O6	Elizabeth St. southwest of Jerome Lane
	Maple tree close to primary		Fall St. between William & Julie Sts.
	Primary through a soft maple tree	O8	Jerome Lane just southeast of Genevieve Place
	Primary through a soft maple tree	O9	Jerome Lane southeast of Genevieve Place
	Chinese elm tree growing into primary	O10	Jerome Lane southeast of Rome St.
	Sweet gum tree into 2-phase primary	O11	Southeast of Kenneth Ave. in the easement between Camp Jackson Rd. (Rt. 157) & Armard Dr.
<b><u>East St. Louis</u></b>			
	Pin oak tree growing into 34 kV line	O13	Ohio Ave. between 29th & 31st Sts.
<b><u>Washington Park</u></b>			
	Chinese elm tree into 3-phase primary	O14, O15	Hill Ave. between 60th & 61st Sts.
	Trees close to primary		Audubon Ave. just east of 57th St.
<b><u>Alton</u></b>			
	Hard maple trees close to primary		State St. north of Northdale
	Trees close to primary		State St. just north of Miller St. & just north of Douglas St.
	Soft maple tree very close to primary		Alby St. south of Brentwood Blvd.
	Elm tree close to primary		Alby St. north of Boynton Dr.
	Single-phase primary through a tree		Alby St. just north of 19th St.
	Primary into box elder tree		Alby St. between 12th & 13th Sts.
	Soft maple tree between primary phase conductors	O22	College Ave. west of Central Ave.
	Locust tree into single-phase primary		Salu St. east of Elizabeth St.
	Gum tree close to primary		Main St. between Brown & Edwards Sts.
	Chinese elm tree into primary		Main St. between Brown St. & Benbow Ave.
	Chinese elm tree into primary	O21	Main St. between Benbow & Bloomfield Sts.
	Chinese elm & soft maple trees into primary		Main St. between Bloomfield & Donald Sts.
	Primary through the edge of a soft maple tree	O20	Main St. between Grandview & Sanford Aves.
	Maple tree into primary		Main St. at Sidney St.
	Single-phase primary through several locust trees	O19	Ida St. west of Main St.
	Sycamore tree very close to primary		Main St. at Yager St.
	Primary "electrotrimming" mulberry tree	O16, O17	Corner of S. Rodgers Ave. & Milton Rd.
	Maple tree contacting primary		Milton Rd. south of Franor St.
	Soft maple tree into primary	O18	Milton Rd. at Oakwood Ave.
	Single-phase primary through a linden tree		2713 Gerson St., Godfrey (might be AmerenIP)